

ARGUMENTS

The Office Action rejected claims 106-117 under 35 USC 103(a) over Keogh et al, Breant (US 20020098357), Wesch et al, (US 4762746) and Maurer et al (US4515632).

Applicant has read the rejection and maintains that the prima facie case of obviousness has not been made. In particular, the prima facie case has not been made as to combining the melamine types of the Markush group of instant claim 1 directly into the polyolefin phase.

The prima facie case of obviousness requires that there be some objective level of success. (See MPEP, Rev. 6, Sept 2007, p2100-141 stating that to establish a prima facie case of obviousness, there must be a reasonable expectation of success.)

The rejection asserts that it would have been obvious to add the intumescent melamine compounds in order to achieve a V-0 or V-1 rating. However, the rejection presents no objective evidence to support the reasonable expectation of success; and as discussed below, the art at the time of the invention taught that melamine was not an alternative.

The objective evidence in Keogh precludes the use of any non-halogenated flame retardant other than metal salts. Keogh teaches in paragraph 0006 that “significant flame retardance [in polyolefins using non-halogenated additives] is only [emphasis added] achieved through the addition of high levels of metal salts, such as aluminum and magnesium hydrates. As Keogh is the most recently published application, and filed after the publication of Breant et al, Keogh’s knowledge of the prior art best represents the understanding that one of ordinary skill had at the time of the invention. That one of ordinary skill knew at the time of the invention that good flame retardancy in polyolefins is only achievable through metal salts is also supported by the Applicant in the instant specification at page 3, lines 12 – 15.

The rejection interprets Keogh as teaching the dispersion of intumescent melamine flame retardants into the polyolefin. (See Response to Arguments, pt 2) However, in no instance is combining the melamine with the polyolefin suggested or taught, and in fact, as discussed above, Keogh teaches against using anything but metal salts in the polyolefin – if one wants to use a non-halogenated high flame retardancy system. Keogh’s objective evidence is based upon what is known, as opposed to what might work – see for instance 0004 – technology

“has been” developed – which imputes a knowledge of what works.

Keogh’s invention is to use the intumescent flame retardants impregnated on a tape and wrapped around the polyolefin. See for example, [0030], the layer 12 (thickness A) is the support layer (polyolefin) and layer 14, thickness B, is the flame proofing intumescent material coating or impregnated onto the backing.

Paragraph 0031, states that a preferred embodiment has the flame retardant in an epoxy/amine hardener system.

Paragraphs 0043 and 0044 compare Figs 3 and 4. Fig 3 is described as having a polyolefin insulator. Fig 4 shows the cable of Fig 3 with the melamine flame retardant in the insulative tape 10 or 15, which is wrapped around the polyolefin. Again, the flame retardant is not in the polyolefin.

Fig 6, discussed in paragraph 0036, uses the tape with melamine as a wrap in either a dual layer wrap (10) or triple layer wrap (15). Example 6 contains a sheath (38) which “could be the fire and thermal insulative wrap 10 or 15”, but discloses that the sheath could also be a polyolefin that is a “non-halogen flame retardant polyolefin”. However, Keogh does not disclose that the non-halogen flame retardant polyolefin contain the intumescent melamine flame retardant. In fact, the “either/or” scenario of wrap 10/15 or a non-halogenated polyolefin establishes the exclusionary teaching of Keogh. It is noted that substituting a non-halogenated polyolefin for wrap 10/15 does not eliminate the thermal insulative wrap 10/15 as the wrap is present as layer 42 outside the bundle.

Keogh lists three types of polyolefin compounds available from Union Carbide (now DOW). The Material Safety Data Sheets of DFDA-1638 and DFDA-1642 are included with this submission. They disclose that the flame retardants of the materials suggested by Keogh are the metal salts (Mg and Al hydroxide), consistent with the teaching of Keogh. (See page 2, COMPOSITION INFORMATION). (The MSDS for DFDA 1683 was not available on line).

In light of the objective information that only the aluminum and magnesium hydroxides work in polyolefins, it is inconceivable why one of ordinary skill would combine the melamine

flame retardant with the polyolefin. At the time of the invention, good flame retardancy in polyolefins is only known to be achieved through the use of aluminum and magnesium hydrates. This statement of knowledge of Keogh is a probative statement of fact, and not conjecture that other additives might work or might fail.

The Office Action cites Breant as advocating the addition of the claimed class of flame retardants to polyolefins. First, Breant is not the state of the art at the time of invention, Keogh is and states that metal salts are the only way to achieve good non-halogenated flame retardancy in polyolefins.

Second, Breant provides several options of flame retardant additives, the first being the same salts as noted in Keogh. (Col 4, Lines 54-56) Breant even states that these salts are generally what will be added. (Col 4, line 53). These are also the only additives used by Breant in the examples (Tables 1-6). While Breant allows that other additives may be used, Breant does not list a melamine compound belonging to the class listed in the Markush group of instant claim 1 rather Breant lists melamine cyanurate (col 5, line 3). Breant cannot be read in isolation but must be read in light of Keogh which was published 2 years after Breant, with Breant being published approximately 4 years before the instant invention. One of ordinary skill would look at Breant, see that although contemplating the use of intumescent, Breant uses the metal salts. The person of ordinary skill at the time of the invention, being aware of Keogh as intervening prior art, would discard Breant's intumescent possibility because one of ordinary skill would know that the only way to achieve good flame retardancy is to use the metal salts. If the only way to achieve good flame retardancy in polyolefins is to use metal salts, one of ordinary skill would have to go against what was known in the art at the time of the invention (Keogh).

Wesch et al. (1988) deals with activated ammonium polyphosphate in an epoxy laminate in conjunction with a restrictive layer. Nowhere is the use in a thermoplastic or polyolefin disclosed. Adding the ammonium polyphosphate, which is not in the claimed markush group anyway, would again go against the teachings of Keogh, stating that good non-halogenated flame retardancy is only achievable in polyolefins which was the current understanding at the time of the invention, 16 years after Wesch.

The rejection also cites Maurer et al. (1985) asserting the melamine is used “in conjunction” with Activated Ammonium Polyphosphate. As a 1985 reference, one of ordinary skill at the time of the invention knows what Keogh teaches, that good flame retardancy is only achieved using the inorganic salts. Therefore, at the time of the invention, one of ordinary skill would not combine the non-metal salt materials of Maurer et al (1985) into a polyolefin.

Additionally, Maurer et al does not teach the combination of melamine and activated ammonium polyphosphate, but teaches the reaction of melamine with ammonium polyphosphate to create the activated ammonium polyphosphate. Melamine is not present in the composition but its reaction product with ammonium polyphosphate is. To say that the reaction product of compound one with compound two renders compound one or compound two obvious is analogous to saying that the presence of water renders hydrogen gas or oxygen obvious or not novel because water is the reaction product of hydrogen with oxygen.

As is evident in the above review, the current claims are not obvious over the cited prior art. It is believed that the arguments overcome all the objections and rejections and that the claims are in position to be allowed over the prior art. A notice of allowance is respectfully requested.

Applicant believes that all fees have been paid electronically, however, the Commissioner is authorized to deduct any fees or underpayments that remain or credit any overcharges to Deposit Account No. 50-3651.

Respectfully submitted,

/Edwin A. Sisson, 48,723/

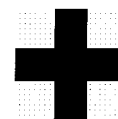
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UNION CARBIDE CORPORATION
A Subsidiary of The Dow Chemical Company
MATERIAL SAFETY DATA SHEET



Product Name: UNIGARD(TM) -RE DFDA-1642 NT
Reduced Emissions FR Compound
MSDS#: 23359

Effective Date: 07/11/2000

Page 1 of 14

Union Carbide urges each customer or recipient of this MSDS to study it carefully to become aware of and understand the hazards associated with the product. The reader should consider consulting reference works or individuals who are experts in ventilation, toxicology, and fire prevention, as necessary or appropriate to use and understand the data contained in this MSDS.

To promote safe handling, each customer or recipient should: 1) Notify its employees, agents, contractors and others whom it knows or believes will use this material of the information in this MSDS and any other information regarding hazards or safety; 2) Furnish this same information to each of its customers for the product; and 3) Request its customers to notify their employees, customers, and other users of the product of this information.

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1.1 IDENTIFICATION

Product Name	UNIGARD(TM) -RE DFDA-1642 NT Reduced Emissions FR Compound
Chemical Name	BASE RESIN: Acetic Acid Ethenyl Ester, Polymer with Ethene
Chemical Family	Natural Pelleted Thermoplastic Nonhalogenated Flame Retardant Polyethylene Compounds
Formula	Not applicable (mixture)
Synonym	None

1.2 COMPANY IDENTIFICATION

Union Carbide Corporation
A Subsidiary of The Dow Chemical Company
39 Old Ridgebury Road
Danbury, CT 06817-0001

1.3 EMERGENCY TELEPHONE NUMBER

24 hours a day: CHEMTREC 1-800-424-9300.

Number for non-emergency questions concerning MSDS (732) 563-5522
Additional information on this product may be obtained by calling the Union Carbide Corporation Customer Service Center at 1-800-568-4000.

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1642 NT
Reduced Emissions FR Compound
MSDS#: 23359

Effective Date: 07/11/2000

Page 2 of 14

2. COMPOSITION INFORMATION

Component	CAS #	Amount (%W/W)
Acetic acid ethenyl ester, polymer with ethene	24937-78-8	>= 20 %
Aluminum hydroxide	21645-51-2	>= 60 <= 80%

3. HAZARDS IDENTIFICATION

3.1 EMERGENCY OVERVIEW

Appearance 0.3 cm (1/8 inch) diameter pellets; whitish color.

Physical State Pellets

Odor Negligible odor

Hazards of product CAUTION! PLASTIC BAG OR LINER, IF PRESENT, MAY CAUSE STATIC IGNITION HAZARD. DUST AND PROCESS FUMES MAY BE HARMFUL IF INHALED AND MAY CAUSE IRRITATION OF SKIN, EYES, AND RESPIRATORY TRACT.

3.2 POTENTIAL HEALTH EFFECTS

General Health Hazards

Avoid breathing vapor in top of shipping container and dust or fumes that may be generated during processing. Dust causes eye irritation, experienced as stinging and discomfort or pain. Polyolefin pellets or granules are abrasive and may cause mechanical skin irritation. Molten or hot polymer will cause thermal burns. Alumina trihydrate is an eye, skin, and at high concentrations a respiratory tract irritant. This additive is compounded into the polymer matrix and thus is not expected to present the same hazards as in the neat state.

Effects of Single Acute Overexposure

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1642 NT
Reduced Emissions FR Compound
MSDS#: 23359

Effective Date: 07/11/2000

Page 3 of 14

Inhalation See General Health Hazards.

Eye Contact See General Health Hazards.

Skin Contact See General Health Hazards.

Skin Absorption No evidence of harmful effects from available information.

Swallowing No evidence of harmful effects from available information.

Chronic, Prolonged or Repeated Overexposure

Effects of Repeated Overexposure No adverse effects anticipated from available information.

Other Effects of Overexposure None currently known.

Medical Conditions Aggravated by Exposure

A knowledge of the available toxicology information and of the physical and chemical properties of the material suggests that overexposure is unlikely to aggravate existing medical conditions.

3.3 POTENTIAL ENVIRONMENTAL EFFECTS

See Section 12 for Ecological Information.

4. FIRST AID PROCEDURES

4.1 INHALATION

If inhaled, remove to fresh air.

4.2 EYE CONTACT

In case of dust contact with eye(s), flush eyes thoroughly with water for several minutes. Remove contact lenses, if worn. Seek medical advice. For thermal eye burns, immediately flush eyes with water and continue washing for several minutes. DO NOT remove contact lenses, if worn. Obtain medical attention without delay, preferably from an ophthalmologist.

4.3 SKIN CONTACT

In case of contact with skin, immediately flush skin with water for a few minutes while removing contaminated clothing and shoes. Wash clothing before reuse. For thermal skin burns, remove clothing, any jewelry, and gross debris from the burned area. Leave blisters intact. Wash the

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1642 NT
Reduced Emissions FR Compound
MSDS#: 23359

Effective Date: 07/11/2000

Page 4 of 14

area thoroughly with room temperature tap water. Do not use ice. Cover the wounded area with gauze dressing moistened with cool water; keep the dressing moist. Seek medical attention.

4.4 SWALLOWING

If swallowed, get medical attention.

4.5 NOTES TO PHYSICIAN

There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

Flash Point - Closed Cup: *Not determined.*

Flash Point - Open Cup: *Not determined.*

Autoignition Temperature: Generally 349-426°C (660-800°F) depending on individual product composition.

Flammable Limits In Air:

Lower	<i>Not determined.</i>
Upper	<i>Not determined.</i>

5.2 EXTINGUISHING MEDIA

Extinguish fires with water spray or apply alcohol-type or all-purpose-type foam by manufacturer's recommended techniques for large fires. Use carbon dioxide or dry chemical media for small fires.

5.3 EXTINGUISHING MEDIA TO AVOID

No information currently available.

5.4 SPECIAL FIRE FIGHTING PROCEDURES

Do not direct a solid stream of water or foam into burning molten material; this may cause spattering and spread the fire.

5.5 SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Use self-contained breathing apparatus and protective clothing.

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1642 NT
Reduced Emissions FR Compound
MSDS#: 23359

Effective Date: 07/11/2000

Page 5 of 14

5.6 UNUSUAL FIRE AND EXPLOSION HAZARDS

Avoid dispersion of dust in air to reduce potential for dust ignition/explosions. Refer to National Fire Protection Association Document NFPA 69 for descriptions of explosion prevention systems.

See Section 8.3 - Engineering Controls

5.7 HAZARDOUS COMBUSTION PRODUCTS

See Section 10.1 - Thermal Decomposition

6. ACCIDENTAL RELEASE MEASURES

Steps to be Taken if Material is Released or Spilled:

Sweep up and collect in suitable container for disposal. CAUTION: Polyethylene pellets on floors are slippery and can cause falls.

Personal Precautions: Wear suitable protective equipment. See Section 8.2 - Personal Protection.

Environmental Precautions: To prevent littering, avoid releases to surface waters.

7. HANDLING AND STORAGE

7.1 HANDLING

General Handling

Do not handle or empty bag or liner in presence of flammable vapor.

Avoid breathing dust and process fumes.

Avoid contact with eyes, skin, and clothing.

Keep container closed.

Use with adequate ventilation.

Wash thoroughly after handling.

FOR INDUSTRY USE ONLY.

Ventilation

Local exhaust ventilation is recommended for control of airborne dust, fumes, and vapor, particularly in confined areas.

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1642 NT
Reduced Emissions FR Compound
MSDS#: 23359

Effective Date: 07/11/2000

Page 6 of 14

7.2 STORAGE

Store in accordance with good industrial practices. Storage information may be obtained from product-specific Union Carbide Storage and Handling Guides, or by calling a Union Carbide Customer Service Representative.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

8.1 EXPOSURE LIMITS

Component	Exposure Limits	Skin Form
Nuisance Dust	10 mg/m3 TWA8 ACGIH	Inhalable Particulate Particulate matter containing no asbestos and crystalline silica <1%
Nuisance Dust	3 mg/m3 TWA8 ACGIH	Respirable particulate Particulate matter containing no asbestos and crystalline silica <1%
Nuisance Dust	5 mg/m3 TWA8 OSHA 15 mg/m3 TWA8 OSHA	Respirable fraction Total dust
Aluminum hydroxide	10 mg/m3 TWA8 ACGIH	Inhalable Particulate Particulate matter containing no asbestos and crystalline silica <1%
Aluminum hydroxide	3 mg/m3 TWA8 ACGIH	Respirable particulate Particulate matter containing no asbestos and crystalline silica <1%
Aluminum hydroxide	5 mg/m3 TWA8 OSHA 15 mg/m3 TWA8 OSHA	Respirable fraction Total dust

In the Exposure Limits Chart above, if there is no specific qualifier (i.e., Aerosol) listed in the Form Column for a particular limit, the listed limit includes all airborne forms of the substance that can be inhaled.

A "Yes" in the Skin Column indicates a potential significant contribution to overall exposure by the cutaneous (skin) route, including mucous membranes and the eyes, either by contact with vapors or by direct skin contact with the substance. A "Blank" in the Skin Column indicates that exposure by the cutaneous (skin) route is not a potential significant contributor to overall exposure.

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1642 NT
Reduced Emissions FR Compound
MSDS#: 23359

Effective Date: 07/11/2000

Page 7 of 14

There are no established OSHA, ACGIH or UCC exposure limits for polymer, however, Union Carbide treats polymer dust as a nuisance particulate.

8.2 PERSONAL PROTECTION

Respiratory Protection: Use NIOSH-approved respirator if unable to control airborne dust, fumes, and vapor.

Ventilation: Local exhaust ventilation is recommended for control of airborne dust, fumes, and vapor, particularly in confined areas.

Other Protective Equipment: Wear gloves and suitable eye protection.

8.3 ENGINEERING CONTROLS

Physical handling and processing of this product such as through pneumatic conveying and grinding, etc., can generate fines and dust particles that can, under certain conditions, pose an explosion hazard. We recommend that the systems used be: (1) equipped with filters of adequate size, (2) operated and maintained in a manner to ensure that no leaks develop and (3) adequately grounded. We further recommend good housekeeping be practiced throughout the facility.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Pellets

Appearance: 0.3 cm (1/8 inch) diameter pellets; whitish color.

pH: *Not currently available.*

Solubility in Water (by weight): *Not determined.*

Odor: Negligible odor

Solid Density: 0.89 - 1.75 g/cm³ 55.561 - 109.249 lb/ft³

Boiling Point (760 mmHg): *Not determined.*

Freezing Point: *Not determined.*

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1642 NT
Reduced Emissions FR Compound
MSDS#: 23359

Effective Date: 07/11/2000

Page 8 of 14

Specific Gravity (H₂O = 1): *Not determined.*

Vapor Pressure at 20°C: *Not determined.*

Vapor Density (air = 1): *Not determined.*

Melting Point: *Not determined.*

Melt Index: 0.1 - 100

10. STABILITY AND REACTIVITY

10.1 STABILITY/INSTABILITY Stable

Conditions to Avoid: Prolonged exposure to temperatures over 250°C (482°F) may cause resin decomposition. When this compound is subjected to temperatures over 200°C (392°F), such as might occur during extruder purging, water will evolve as a gas. The water vapor can form large bubbles which can burst and spatter molten polyethylene around the immediate area. Contact with any exposed part of the body could cause burns.

Thermal Decomposition: Carbon monoxide is highly toxic if inhaled; carbon dioxide in sufficient concentrations can act as an asphyxiant. Aldehydes are known irritants. In addition, some aldehydes are skin sensitizers and/or probable carcinogens. Acute overexposure to the decomposition products may result in headache, nausea, and irritation of the eyes, skin and respiratory tract. Local exhaust ventilation is recommended for control of airborne dust, fumes and vapor.

Thermal Decomposition Products

Carbon monoxide
Carbon dioxide
Aldehydes
Acetic acid
Organic Acids
Other Organic Vapor

10.2 HAZARDOUS POLYMERIZATION Will Not Occur.

10.3 INHIBITORS/STABILIZERS Not applicable.

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1642 NT
Reduced Emissions FR Compound
MSDS#: 23359

Effective Date: 07/11/2000

Page 9 of 14

11. TOXICOLOGICAL INFORMATION

The following information is based on published toxicity data for the base polymer of this product (acetic acid ethenyl ester, polymer with ethene). These data were not produced by Union Carbide Corporation.

ACUTE TOXICITY

Peroral

Rat; LD50 = 5010 mg/kg

IRRITATION

Eye:

Results: Rabbit eye irritation score = 3.3 of a possible 110

12. ECOLOGICAL INFORMATION

12.1 ENVIRONMENTAL FATE

Degradation of this polyethylene product is not anticipated under environmental exposure conditions.

12.2 ECOTOXICITY

Information may be available, call Union Carbide.

12.3 FURTHER INFORMATION

None.

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1642 NT
Reduced Emissions FR Compound
MSDS#: 23359

Effective Date: 07/11/2000

Page 10 of 14

13. DISPOSAL CONSIDERATIONS

13.1 WASTE DISPOSAL METHOD

Dispose in accordance with all applicable Federal, State, and local environmental regulations. Empty containers should be recycled or disposed of through an approved waste management facility.

13.2 DISPOSAL CONSIDERATIONS

When disposed of, this product is not considered a RCRA hazardous waste. Dispose of in accordance with local, state and federal regulations.

Disposal methods identified are for the product as sold. For proper disposal of used material, an assessment must be completed to determine the proper and permissible waste management options permissible under applicable rules, regulations and/or laws governing your location.

14. TRANSPORT INFORMATION

14.1 U.S. D.O.T.

NON-BULK

Proper Shipping Name : NOT REGULATED

BULK

Proper Shipping Name : NOT REGULATED

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

15.1 FEDERAL/NATIONAL

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1642 NT
Reduced Emissions FR Compound
MSDS#: 23359

Effective Date: 07/11/2000

Page 11 of 14

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 SECTION 103 (CERCLA)

The following components of this product are specifically listed as hazardous substances in 40 CFR 302.4 (unlisted hazardous substances are not identified) and are present at levels which could require reporting:

Component	CAS #	Amount
Vinyl acetate	108-05-4	>= 0.0001 <= 0.0003%

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 TITLE III (EPCRA) SECTIONS 302 AND 304

The following components of this product are listed as extremely hazardous substances in 40 CFR Part 355 and are present at levels which could require reporting and emergency planning:

None.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 TITLE III (EPCRA) SECTION 313

The following components of this product are listed as toxic chemicals in 40 CFR 372.65 and are present at levels which could require reporting and customer notification under Section 313 and 40 CFR Part 372:

- This product does not contain toxic chemicals at levels which require reporting under the statute.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 TITLE III (EPCRA) SECTIONS 311 AND 312

Delayed Hazard : No
Fire Hazard : No
Immediate Health Hazard : Yes
Reactive Hazard : No
Sudden Release of Pressure Hazard : No

TOXIC SUBSTANCES CONTROL ACT (TSCA)

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements.

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1642 NT
Reduced Emissions FR Compound
MSDS#: 23359

Effective Date: 07/11/2000

Page 12 of 14

15.2 STATE/LOCAL

PENNSYLVANIA (WORKER AND COMMUNITY RIGHT-TO-KNOW ACT)

This product is subject to the Worker and Community Right-to-Know Act. The following components of this product are at levels which could require identification in the MSDS: None.

MASSACHUSETTS (HAZARDOUS SUBSTANCES DISCLOSURE BY EMPLOYERS)

The following components of this product appear on the Massachusetts Substance List and are present at levels which could require identification in the MSDS:

Component	CAS #	Amount
Quartz	14808-60-7	>= 0.0050 <= 0.1000%
Vinyl acetate	108-05-4	>= 0.0001 <= 0.0003%

CALIFORNIA PROPOSITION 65 (SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986)

This product contains the following chemical(s) known to the State of California to cause cancer:

Component	CAS #	Amount
Vinyl acetate	108-05-4	>= 0.0001 <= 0.0003%

This section provides selected regulatory information on this product including its components. This is not intended to include all regulations. It is the responsibility of the user to know and comply with all applicable rules, regulations and laws relating to the product being used.

16. OTHER INFORMATION

16.1 AVAILABLE LITERATURE AND BROCHURES

Additional information on this product may be obtained by calling the Union Carbide Corporation Customer Service Center at 1-800-568-4000.

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1642 NT
Reduced Emissions FR Compound
MSDS#: 23359

Effective Date: 07/11/2000

Page 13 of 14

Read and understand Union Carbide's "Polyethylene Handling and Storage Guide" prior to handling.

16.2 SPECIFIC HAZARD RATING SYSTEM

Additional information on this product may be obtained by calling the Union Carbide Corporation Customer Service Center at 1-800-568-4000.

16.3 RECOMMENDED USES AND RESTRICTIONS

FOR INDUSTRY USE ONLY

NOTICE: This product is specifically designed for wire and cable applications. It is unsuitable for use in applications such as direct or indirect food contact, medical device or pharmaceutical applications, or for potable water applications without express NSF or UL approval.

16.4 REVISION

Version: 3.0

Revision: 07/11/2000

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

16.5 LEGEND

A	Asphyxiant
Bacterial/NA	Non Acclimated Bacteria
F	Fire
H	Health
HMIS	Hazardous Materials Information System
N/A	Not available
NFPA	National Fire Protection Association
O	Oxidizer
P	Peroxide Former
R	Reactivity
TS	Trade Secret
VOL/VOL	Volume/Volume
W	Water Reactive
W/W	Weight/Weight

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1642 NT
Reduced Emissions FR Compound

Effective Date: 07/11/2000

MSDS#: 23359

Page 14 of 14

The opinions expressed herein are those of qualified experts within Union Carbide. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of the use of the product are not under the control of Union Carbide, it is the user's obligation to determine conditions of safe use of the product.



THE DOW CHEMICAL COMPANY
MATERIAL SAFETY DATA SHEET



Product Name: UNIGARD(TM) -RE DFDA-1638 NT
Reduced Emissions FR Compound
MSDS#: 35042

Effective Date: 04/16/2003

Page 1 of 15

CAUTION!! This is an experimental product. Complete safety information is not available.

Dow (hereinafter, and for purposes of this MSDS only, refers to The Dow Chemical Company and to Dow Chemical Canada Inc.) encourages and expects you to read and understand the entire MSDS, as there is important information throughout the document. Dow expects you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1.1 IDENTIFICATION

Product Name UNIGARD(TM) -RE DFDA-1638 NT Reduced Emissions FR Compound

1.2 COMPANY IDENTIFICATION

The Dow Chemical Company
Midland, MI 48674

1.3 EMERGENCY TELEPHONE NUMBER

24-HOUR EMERGENCY TELEPHONE NUMBER: (989)636-4400.
Customer Information Number: 1-800-258-2436.

* or ® Indicates a Trademark of The Dow Chemical Company.

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1638 NT
Reduced Emissions FR Compound
MSDS#: 35042

Effective Date: 04/16/2003

Page 2 of 15

2. COMPOSITION INFORMATION

Component	CAS #	Amount (%W/W)
1-Hexene, polymer with ethene	25213-02-9	>= 50 %
Magnesium hydroxide	1309-42-8	>= 15 <= 30%
Carbon black	1333-86-4	>= 1 <= 5%

3. HAZARDS IDENTIFICATION

3.1 EMERGENCY OVERVIEW

Appearance	Black
Physical State	Pellets
Odor	Odorless
Hazards of product	POWDERED MATERIAL MAY FORM EXPLOSIVE DUST-AIR MIXTURE. SLIPPING HAZARD.

3.2 POTENTIAL HEALTH EFFECTS

General Health Hazards

Avoid breathing dust or any fumes that may be generated during processing. Dust causes eye irritation, experienced as stinging and discomfort or pain. Polyolefin pellets or granules are abrasive and may cause mechanical skin irritation. Molten or hot polymer will cause thermal burns. Magnesium hydroxide is a skin, eye, and respiratory tract irritant at high concentrations. In high temperature processes, Magnesium Oxide (MgO) fume may be formed. MgO is a mild irritant to the eyes, skin and respiratory tract. Experimental evidence suggests that MgO is capable of causing metal fume fever. Exposure to MgO fume should be maintained at or below the current ACGIH TLV of 10 mg/m³ TWA 8. This additive is compounded into the polymer matrix and thus is not expected to present the same hazards as in the neat state.

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1638 NT
Reduced Emissions FR Compound
MSDS#: 35042

Effective Date: 04/16/2003

Page 3 of 15

Effects of Single Acute Overexposure

Inhalation See General Health Hazards.

Eye Contact See General Health Hazards.

Skin Contact See General Health Hazards.

Skin Absorption No evidence of harmful effects from available information.

Swallowing No evidence of harmful effects from available information.

Chronic, Prolonged or Repeated Overexposure

Effects of Repeated Overexposure No adverse effects anticipated from available information.

Other Effects of Overexposure None currently known.

Medical Conditions Aggravated by Exposure

A knowledge of the available toxicology information and of the physical and chemical properties of the material suggests that overexposure is unlikely to aggravate existing medical conditions.

See Section 11 for toxicological information and additional information about potential health effects.

3.3 POTENTIAL ENVIRONMENTAL EFFECTS

See Section 12 for Ecological Information.

4. FIRST AID PROCEDURES

4.1 INHALATION

If inhaled, remove to fresh air.

4.2 EYE CONTACT

In case of dust contact with eye(s), flush eyes thoroughly with water for several minutes. Remove contact lenses, if worn. Seek medical advice if irritation persists. For thermal eye burns, immediately flush eyes with water and continue washing for several minutes. DO NOT remove contact lenses, if worn. Obtain medical attention without delay, preferably from an ophthalmologist.

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1638 NT
Reduced Emissions FR Compound
MSDS#: 35042

Effective Date: 04/16/2003

Page 4 of 15

4.3 SKIN CONTACT

For thermal skin burns, remove clothing, any jewelry, and gross debris from the burned area. Leave blisters intact. Wash the area thoroughly with room temperature tap water. Do not use ice. Cover the wounded area with gauze dressing moistened with cool water; keep the dressing moist. Seek medical attention.

4.4 SWALLOWING

No emergency care anticipated.

4.5 NOTES TO PHYSICIAN

There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES - REFER TO SECTION 9, PHYSICAL AND CHEMICAL PROPERTIES

5.2 EXTINGUISHING MEDIA

Extinguish fires with water spray or apply alcohol-type or all-purpose-type foam by manufacturer's recommended techniques for large fires. Use carbon dioxide or dry chemical media for small fires.

5.3 FIRE FIGHTING PROCEDURES

Do not direct a solid stream of water or foam into burning molten material; this may cause spattering and spread the fire.

5.4 SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Use self-contained breathing apparatus and protective clothing.

5.5 UNUSUAL FIRE AND EXPLOSION HAZARDS

Avoid dispersion of dust in air to reduce potential for dust ignition/explosions. Refer to National Fire Protection Association Document NFPA 69 for descriptions of explosion prevention systems.

5.6 HAZARDOUS COMBUSTION PRODUCTS

See Section 10.1 - Thermal Decomposition

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1638 NT
Reduced Emissions FR Compound
MSDS#: 35042

Effective Date: 04/16/2003

Page 5 of 15

6. ACCIDENTAL RELEASE MEASURES

Steps to be Taken if Material is Released or Spilled:

Sweep up and collect in suitable container for disposal. CAUTION: Polyethylene pellets on floors are slippery and can cause falls.

Personal Precautions: Wear suitable protective equipment. See Section 8.2 - Personal Protection.

Environmental Precautions: To prevent littering, avoid releases to surface waters.

7. HANDLING AND STORAGE

7.1 HANDLING

General Handling

No smoking, open flames or sources of ignition in handling and storage area.
Good housekeeping and controlling of dusts are necessary for safe handling of product.
Avoid breathing process fumes.

Ventilation

Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

7.2 STORAGE

Store in accordance with good industrial practices. Storage information may be obtained from product-specific Storage and Handling Guides, or by calling Dow's Customer Information Group at 1-800-258-2436 (U.S.) or 1-800-331-6451 (Canada).

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

8.1 EXPOSURE LIMITS

Component	Exposure Limits	Skin	Form
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MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1638 NT
Reduced Emissions FR Compound
MSDS#: 35042

Effective Date: 04/16/2003

Page 6 of 15

Particulates (Insoluble) Not Otherwise Specified (PNOS)	10 mg/m3 TWA8 ACGIH	Inhalable Particulate Particulate matter containing no asbestos and crystalline silica <1%
Particulates (Insoluble) Not Otherwise Specified (PNOS)	3 mg/m3 TWA8 ACGIH	Respirable particulate Particulate matter containing no asbestos and crystalline silica <1%
Particulates (Insoluble) Not Otherwise Specified (PNOS)	5 mg/m3 TWA8 OSHA	Respirable fraction
	15 mg/m3 TWA8 OSHA	Total dust
Magnesium hydroxide	10 mg/m3 TWA8 Dow IHG	
Carbon black	3.5 mg/m3 TWA8 ACGIH	
	3.5 mg/m3 TWA8 OSHA	

In the Exposure Limits Chart above, if there is no specific qualifier (i.e., Aerosol) listed in the Form Column for a particular limit, the listed limit includes all airborne forms of the substance that can be inhaled.

A "Yes" in the Skin Column indicates a potential significant contribution to overall exposure by the cutaneous (skin) route, including mucous membranes and the eyes, either by contact with vapors or by direct skin contact with the substance. A "Blank" in the Skin Column indicates that exposure by the cutaneous (skin) route is not a potential significant contributor to overall exposure.

"Interim IHGs" are occupational exposure limits set by the original owner of this product prior to the merger with Dow. These limits have not been reviewed per the Dow IHG process, but are utilized during this period of merger integration until Dow can formally adopt or modify.

8.2 PERSONAL PROTECTION

Respiratory Protection:

Atmospheric levels should be maintained below the exposure guideline.
When airborne exposure guidelines and/or comfort levels may be exceeded, use an approved air-purifying respirator.
For emergency response or for situations where the atmospheric level is unknown, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply.

Ventilation:

Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1638 NT
Reduced Emissions FR Compound
MSDS#: 35042

Effective Date: 04/16/2003

Page 7 of 15

Other Protective Equipment: Wear gloves and suitable eye protection.

II

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Pellets

Appearance: Black

Odor: Odorless

Flash Point - Closed Cup: *No test data available.*

Flammable Limits In Air:

Lower	<i>No test data available.</i>
Upper	<i>No test data available.</i>

Autoignition Temperature: Generally 260-410°C (500-770°F) depending on individual product composition.

Vapor Pressure: *No test data available.*

Boiling Point (760 mmHg): *No test data available.*

Vapor Density (air = 1): *No test data available.*

Specific Gravity (H₂O = 1): *No test data available.*

Solid Density: 1 - 1.2 g/cm³ 62.43 - 74.91 lb/ft³

Freezing Point: *No test data available.*

Melting Point: *No test data available.*

Solubility in Water (by weight): *No test data available.*

pH: *No test data available.*

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1638 NT
Reduced Emissions FR Compound
MSDS#: 35042

Effective Date: 04/16/2003

Page 8 of 15

10. STABILITY AND REACTIVITY

10.1 STABILITY/INSTABILITY Stable

Conditions to Avoid: Prolonged exposure to temperatures over 250°C (482°F) may cause resin decomposition.

Thermal Decomposition: Carbon monoxide is highly toxic if inhaled; carbon dioxide in sufficient concentrations can act as an asphyxiant. Aldehydes are known irritants. In addition, some aldehydes are skin sensitizers and/or probable carcinogens. Acute overexposure to the decomposition products may result in headache, nausea, and irritation of the eyes, skin and respiratory tract. Local exhaust ventilation is recommended for control of airborne dust, fumes and vapor.

Thermal Decomposition Products

Carbon monoxide
Carbon dioxide
Aldehydes
Other organic vapor

10.2 HAZARDOUS POLYMERIZATION Will not occur.

11. TOXICOLOGICAL INFORMATION

The following polyethylene information is based on published toxicity data for associated base polymers (ethene homopolymer, 1-butene polymer with ethene, and 1-hexene polymer with ethene). These data were not produced by Dow. Materials that are compounded in and, therefore, not available for exposure, are not considered in this section.

ACUTE TOXICITY

Peroral

Rat; Lethal Dose = > 7.95 g/kg; polymer, no effects

Peroral

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1638 NT
Reduced Emissions FR Compound
MSDS#: 35042

Effective Date: 04/16/2003

Page 9 of 15

Mouse; Lethal Dose = > 7.0 g/kg; polymer

Inhalation

Variable Dust Concentration Studies, 0.5 h Mouse; LC50 = 12000 mg/m3

IRRITATION

Skin:

Results: Pellets or granules may cause abrasion or other mechanical irritation.

Eye:

Results: May cause irritation.

REPEATED EXPOSURE

Inclusion of 1-butene polymer with ethene in the diet of rats for 90 days at 5% or less caused no adverse effects.

SENSITIZATION (ANIMAL AND HUMAN STUDIES)

Polyethylene is not considered to be a skin sensitizer.

CHRONIC TOXICITY AND CARCINOGENICITY

According to published data, inclusion of polyethylene in the diet of rats at 8 g/kg/day did not result in treatment-related effects. Polyethylene implanted into rats and mice has reportedly caused local tumorigenic activity at doses of 33 to 2120 mg/kg, but the relevance to human exposure is not certain. There has been extensive use of polyethylene in industry and medicine., Carbon Black has been classified by IARC as possibly carcinogenic to humans (2B). Epidemiology studies of workers in Carbon Black production do not indicate that Carbon Black is carcinogenic to humans. Under workplace exposure concentrations that far exceed current occupational standards, slight lung radiographic changes and reductions in lung function have been observed. Chronic inflammation, lung fibrosis and lung tumors have been observed in some experimental studies of rats exposed chronically to excessively high air concentrations of Carbon Black and several other inert fine dust particles. These results with Carbon Black have not been duplicated in two other animal species using similar study conditions. Present evidence suggests that the adverse health effects observed in the rat inhalation studies are the result of the massive accumulation of small dust particles in the lung which overwhelm the natural lung clearance mechanisms, termed "lung overloading", rather than from a specific toxic effect of the dust particles in the lung. The Carbon Black in this product is compounded into the polymer matrix, and is not anticipated to pose the same health hazards as neat Carbon Black.

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1638 NT
Reduced Emissions FR Compound
MSDS#: 35042

Effective Date: 04/16/2003

Page 10 of 15

CARCINOGENICITY CLASSIFICATIONS

Component	Agency	Classification
Carbon black	IARC	Group 2B: Possibly Carcinogenic to Humans

12. ECOLOGICAL INFORMATION

12.1 ENVIRONMENTAL FATE

Degradation of this polyethylene product is not anticipated under environmental exposure conditions.

12.2 ECOTOXICITY

Information may be available, call Dow.

12.3 FURTHER INFORMATION

None.

13. DISPOSAL CONSIDERATIONS

13.1 DISPOSAL

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. DOW HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1638 NT
Reduced Emissions FR Compound
MSDS#: 35042

Effective Date: 04/16/2003

Page 11 of 15

PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION 2 (Composition/ Information on Ingredients). FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: recycler. reclaimer. incinerator or other thermal destruction device. landfill. As a service to its customers, Dow can provide names of information resources to help identify waste management companies and other facilities which recycle, reprocess or manage chemicals or plastics, and that manage used drums. Telephone Dow's Customer Information Group at 1-800-258-2436 or 1-989-832-1556 (U.S.), or 1-800-331-6451 (Canada) for further details .

14. TRANSPORT INFORMATION

14.1 U.S. D.O.T.

NON-BULK

Proper Shipping Name : NOT REGULATED

BULK

Proper Shipping Name : NOT REGULATED

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

15.1 FEDERAL/NATIONAL

|| OSHA HAZARD COMMUNICATION STANDARD

|| This product is not a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1638 NT
Reduced Emissions FR Compound
MSDS#: 35042

Effective Date: 04/16/2003

Page 12 of 15

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 TITLE III (EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW ACT) SECTION 313

This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act 1986 and 40 CFR Part 372.

To the best of our knowledge this product does not contain chemicals at levels which require reporting under this statute.

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (CERCLA) SECTION 103

This product contains the following substances subject to CERCLA Section 103 reporting requirements and are listed in 40 CFR Part 302.4.

Because no constituents of the polyethylene resin are released to the environment under normal conditions of use and processing, the resin and its constituents are not subject to the emergency release reporting provisions of Section 103 of CERCLA or Section 304 of SARA Title III (EPCRA).

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 TITLE III (EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW ACT) SECTION 302

This product contains the following substances subject to SARA Section 302 reporting requirements and are listed in 40 CFR Part 302.4.

To the best of our knowledge this product does not contain chemicals at levels which require reporting under this statute.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 TITLE III (EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW ACT) SECTIONS 311 AND 312

Delayed (Chronic) Health Hazard : No
Fire Hazard : No
Immediate (Acute) Health Hazard : No
Reactive Hazard : No
Sudden Release of Pressure Hazard : No

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1638 NT

Effective Date: 04/16/2003

Reduced Emissions FR Compound

MSDS#: 35042

Page 13 of 15

CEPA - DOMESTIC SUBSTANCES LIST (DSL)

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

TOXIC SUBSTANCES CONTROL ACT (TSCA)

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements.

15.2 STATE/LOCAL

PENNSYLVANIA (WORKER AND COMMUNITY RIGHT-TO-KNOW ACT)

The following product components are cited in the Pennsylvania Hazardous Substances List, the Pennsylvania Special Hazardous Substance List, and/or the Pennsylvania Environmental Hazardous Substance list, and are present at levels which require reporting.

Component	CAS #	Amount
Carbon black	1333-86-4	>= 1.0000 <= 5.0000%

This section provides selected regulatory information on this product including its components. This is not intended to include all regulations. It is the responsibility of the user to know and comply with all applicable rules, regulations and laws relating to the product being used.

16. OTHER INFORMATION

16.1 ADDITIONAL INFORMATION

Additional information on this product may be obtained by calling Dow's Customer Information Group at 1-800-258-2436 (U.S.) or 1-800-331-6451 (Canada).

Read and understand Dow's "Polyethylene Handling and Storage Guide" prior to handling.

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1638 NT
Reduced Emissions FR Compound
MSDS#: 35042

Effective Date: 04/16/2003

Page 14 of 15

16.2 HAZARD RATING SYSTEM

NFPA ratings for this product are: H - 0 F - 1 R - 0

These ratings are part of a specific hazard communication program and should be disregarded where individuals are not trained in the use of this hazard rating system. You should be familiar with the hazard communication programs applicable to your workplace.

16.3 RECOMMENDED USES AND RESTRICTIONS

NOTICE: This product is specifically designed for wire and cable applications. It is unsuitable for use in applications such as direct or indirect food contact, medical device or pharmaceutical applications, or for potable water applications without express NSF or UL approval.

FOR INDUSTRY USE ONLY.

16.4 REVISION

Version: 3.0

Revision: 04/16/2003

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

16.5 LEGEND

Bacterial/NA	Non Acclimated Bacteria
F	Fire
H	Health
IHG	Industrial Hygiene Guideline
N/A	Not available
NFPA	National Fire Protection Association
O	Oxidizer
R	Reactivity
TS	Trade secret
VOL/VOL	Volume/Volume
W	Water Reactive
W/W	Weight/Weight

MATERIAL SAFETY DATA SHEET

Product Name: UNIGARD(TM) -RE DFDA-1638 NT
Reduced Emissions FR Compound
MSDS#: 35042

Effective Date: 04/16/2003

Page 15 of 15

NOTICE: Dow urges each customer or recipient of this MSDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this MSDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given., Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that its activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of Dow, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product., Due to the proliferation of sources for information such as manufacturer-specific MSDSs, Dow is not and cannot be responsible for MSDSs obtained from any source other than Dow. If you have obtained a Dow MSDS from a non-Dow source or if you are not sure that a Dow MSDS is current, please contact Dow for the most current version.